Densified Silica Fume Data Sheet

DESCRIPTION

Elkon Products Alberta Inc. Silica Fume is a fine pozzolanic material composed of amorphous silica that is produced during the production of silicon-metal or ferro-silicon alloys. It can be used in various cementitious products such as concrete, grout, shotcrete, and mortar. Densified silica fume has a bulk density of about 650-750 kg/m3, while undensified silica fume has a bulk density of about 150-300kg/m3.

Composed of extremely fine particles with a high silica content, Elkon Products Alberta Inc. silica fume is a highly effective pozzolanic material. As a reactive pozzolan, it chemically reacts with the calcium hydroxide in cement paste to form a stronger calcium silica hydrate. This improves the bond between paste and aggregate, making it ideal for shotcrete, and increasing concrete strength. Typically grey in color, Elkon Products Alberta Inc. silica fume is classified as a supplementary cementitious material (SCM) and is compliant with ASTM C1240 (CSA A23.5). It is described as a 'Densified Amorphous Fumed Silica.'

TYPICAL USES

Elkon Products Alberta Inc. silica fume is a micro-filling material that physically fills the voids between cement particles. It lowers permeability and reduces the size and number of capillaries that allow contaminants to enter the matrix. The chemical properties of silica fume can greatly enhance the strength performance and bonding properties of concrete. It can be used in various applications and projects such as commercial, civil, mining, and marine projects. Elkon Products Alberta Inc. silica fume is suitable for inclusion in general concrete mix designs and in particular has application in high strength/performance concretes and shotcrete/spray mixes.

ADVANTAGES

Physical/Chemical

- ✓ Decreased matrix permeability
- ✓ Reduced chloride ion penetration
- ✓ Increased resistance to sulfate attack
- ✓ Increased resistance to alkali-silica reactivity
- ✓ Increased pumpability & workability
- ✓ Reduced concrete bleeding

Mechanical

- ✓ Increased compressive strength
- ✓ Increased modulus of elasticity
- ✓ Increased flexural strength
- ✓ Increased abrasion resistance
- ✓ Improved freeze-thaw resistance
- ✓ Increased impact resistance

DOSAGE

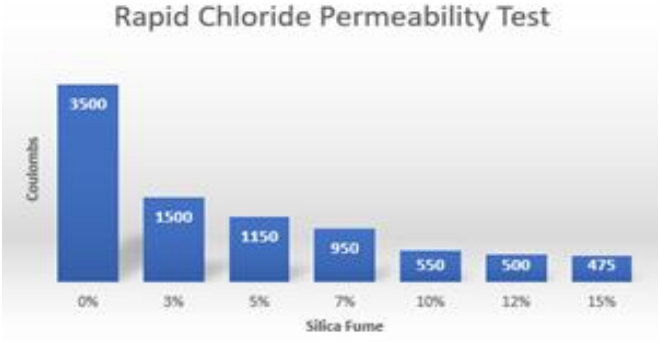
Recommended dosage for use in concrete and wet shotcrete applications: 5% to 15% in addition by weight of cement. For concrete, and wet shotcrete, silica fume is batched at the concrete production plant in a manner like that for cement, or other cementitious materials such as fly ash. Refer to the ACI 234R guideline or to the silica fume association user's manual for specific batching and mixing instructions.

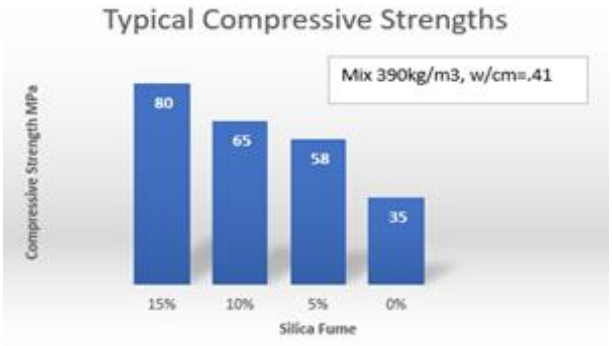
COMPATIBILITY

Silica fume is compatible, and effective in concrete containing all types of Portland, and blended cement which may include supplementary cementitious materials such as fly ash, and granulated ground blast furnace slag[1]. Silica fume is also suitable for use with chemical admixtures such as water-reducing, accelerating, and retarding admixtures which comply to ASTM C1240 (CSA A23.5).

TYPICAL RESULTS

Parameters	Unit	ASTM C1240 Specification		CSA A3000-18 Specification		Results
		Min	Max	Min	Max	
SiO_2	%	85	-	85	-	94.97
SO_3	%	-	-	-	1	0.27
Cl	%	-	-	-	-	0.07
Total Alkalis as Na_2O eq	%	Report		-	-	0.62
Moisture	%	-	3	-	3	0.50
Loss on Ignition	%	-	6	-	10	2.53
pH		-	-	-	-	6.92
Retained on 325 sieve (+45µm)	%	-	10	-	10	2.42
Density (specific gravity)	g/m^3	Report		-	-	2.16
Undensified - Bulk Density	kg/m^3	Report		-	-	146
BET Specific Surface Area	m^2/g	15	-	-	-	19.3
Accelerated Pozzolanic Activity Index	%	105	-	105	-	125.1
Tendency to Entrap Air (per CSA)		-	-	*No Visible Layer of Foam*		No Visible Layer of Foam





PACKAGING

Elkon Products Alberta Inc. densified silica fume is available in 11.34 kg, shredable bags, 907kg/Pallet, 952kg/Pallet, bulk bags, or by bulk delivery. Elkon Products Alberta Inc. undensified silica fume is available in 20 KG bags (48 per Pallet).

SAFE HANDLING

Elkon Products Alberta Inc. silica fume is classified as hazardous according to the NOHSC criteria and represents a dust hazard that may cause irritation. Users should consult the SDS for information regarding health and safety. The SDS for this material is available from Elkon Products Alberta Inc.

STORAGE – SHELF LIFE

Silica fume has a shelf life of 24 months when stored in a dry protected environment.

WARRANTY

Elkon Products Alberta Inc. warrants the products supplied to be free of material defects and to be of a consistent quality. Should any product be proven to be defective, the liability of the manufacturer shall be limited to the replacement of the product ex-factory. The manufacturer gives no warranty as to the fitness of the products for any particular purpose. The user shall determine the suitability of the product for its intended use and comply with the directions for use. Safe handling information is available from Elkon Products Alberta Inc. The user is to assume all risks and liabilities in connection with the use of this product.

Note: Elkon Products requires that the 11.3 Kg shredder bags to be cut and only the contents should be added to the batch, unless prior written approval has been obtained from Elkon Products directly.

CONTACT

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